



Early Journal Content on JSTOR, Free to Anyone in the World

This article is one of nearly 500,000 scholarly works digitized and made freely available to everyone in the world by JSTOR.

Known as the Early Journal Content, this set of works include research articles, news, letters, and other writings published in more than 200 of the oldest leading academic journals. The works date from the mid-seventeenth to the early twentieth centuries.

We encourage people to read and share the Early Journal Content openly and to tell others that this resource exists. People may post this content online or redistribute in any way for non-commercial purposes.

Read more about Early Journal Content at <http://about.jstor.org/participate-jstor/individuals/early-journal-content>.

JSTOR is a digital library of academic journals, books, and primary source objects. JSTOR helps people discover, use, and build upon a wide range of content through a powerful research and teaching platform, and preserves this content for future generations. JSTOR is part of ITHAKA, a not-for-profit organization that also includes Ithaka S+R and Portico. For more information about JSTOR, please contact support@jstor.org.

THE
QUARTERLY JOURNAL
OF
ECONOMICS

NOVEMBER, 1902

THE SUGAR INDUSTRY AND LEGISLATION
IN EUROPE.

I. THE RISE OF THE BEET-SUGAR INDUSTRY.

It may be doubted whether any phase of the agricultural history of the nineteenth century presents a series of more interesting problems than the rise of the beet-sugar industry in Europe. The parent of the present sugar beet was indeed known and cultivated from the earliest times of historical antiquity. Herodotus mentions it as one of the plants which served to nourish the builders of the Pyramids. Hannibal, we are told, drew back from before Casilinum because the inhabitants made sport of their wants by cultivating beets upon the town walls. Pliny gives careful rules for their planting and cultivation.

But, although the beet had long been cultivated, and its sweetness was early recognized, the fact that it could be used for the manufacture of sugar identical with the product of the sugar cane was not discovered until 1747 ; and its use for that purpose has been practically confined

to the last hundred years, while it is only within twenty years that beet sugar has attained a position of decided predominance in the sugar markets of Europe.

This great revolution in the sugar industry has been made under conditions in many respects peculiar. The beet is regarded as indigenous, and certainly has long grown wild in some of the most important seats of present and past cane-sugar production,—in India, Mesopotamia, and along the shores of the Mediterranean. The successful cultivation of the beet for sugar, however, began and has continued in central and northern Europe; and its extension in recent years has shown a distinctly northward tendency, being especially marked in Sweden, Denmark, and north-eastern Prussia.*

Not less interesting is the paradoxical position which the industry occupies in connection with the European agricultural crisis of the past thirty years. The chief cause of that crisis has been the great extension of agriculture to new fields through the "space-annihilating" instrumentality of the steamship and the railway. The competition which Europe has had to face from these new fields has naturally been most keen in the production of staple commodities, such as grain and wool, which are neither too bulky nor too perishable to be

* During the last three or four years a considerable development of the beet culture has taken place in latitudes further south, especially in Italy, Spain, and the United States; but it is as yet too soon to attempt to forecast the future of the industry in these countries. On the subject of the geographical distribution of the industry a flood of light is thrown by the recent investigations of the United States Department of Agriculture into the "Influence of Environment on the Composition of the Sugar Beet" (Bulletin 64 of the Bureau of Chemistry, by Dr. H. W. Wiley). As to the results of these investigations, Dr. Wiley says: "The production of sugar in the beet is practically a function of sunshine; and so, the higher we can go north in the summer-time, the longer the hours of sunshine and the greater the production of sugar will be. In fact, it has been shown that the beet-sugar industry does best when pushed as far north as will permit the growth and harvesting of the crop before the freezes of winter set in." Here we have certainly an important circumstance in giving northern Europe its predominance in beet-sugar production. It is the conjunction of warm climate and long summer days. The

transported long distances. The production of wool has decidedly fallen off in almost all European countries during the last fifteen or twenty years, having actually increased in Switzerland alone. In England the acreage devoted to wheat was less than half as great in 1896 as in 1868. And if, owing to the protection afforded by import duties, a similar movement is not to be seen in France and Germany, it is nevertheless evident from a glance at the statistics of imports and exports that the grain production has kept pace neither with the growth of the population nor with the progress of agriculture in other directions. The agriculturists of Europe have indeed more and more ceased to produce such articles, and have turned their attention either to special commodities, such as wine, for which the soil and climate of particular regions are peculiarly adapted, or to garden vegetables, dairy produce, and other perishable products.

Now sugar is an article which seems to fulfil all of the requirements for production at a distance from the market. It is non-perishable and of little bulk, and an article of large and steady consumption. Nevertheless, beet sugar continues to drive cane sugar out of the markets of the world ; and the growing of the beet, which is suited to cultivation within a wide range of latitude and on a great

severer climate of the same latitudes in America prevents the cultivation of the beet to advantage, and drives it southward to regions where it receives less sunshine and is therefore less rich in sugar. The temperature zone in which the beet attains its greatest perfection (see Farmer's Bulletin No. 52, Department of Agriculture) passes almost wholly south of latitude 45 degrees north in the United States : whereas, practically, no sugar is produced south of that latitude in Europe,—excepting Spain and Italy, above mentioned,—and the greater part of the beets in Europe are raised north of latitude 50 degrees. The fogs of England have also no doubt been as inhospitable to the beet as has the government. The influence of the methods of beet raising, which requires intensive cultivation and admits of slight use of machinery, upon the slow progress of the industry in the United States, has been pointed out in the last chapter of Taussig's *Tariff History*. The progress of the industry in America during the last few years seems largely due to the partial overcoming of this difficulty by a greater application of machinery to the cultivation of the beet.

variety of soils, concentrates itself within the most thickly populated agricultural districts of Europe, having as yet made comparatively insignificant progress in other parts of the world.

These several paradoxes lend an especial interest for the economist and statesman to the nature of the legislative systems which have surrounded the development of the beet-sugar industry. No other agricultural industry presents so much the appearance of a hot-house growth. Born under the exceptionally artificial conditions of Napoleon's "Continental System," fed in its infancy on the rich food of governmental bounties and prizes, the industry has at no time been completely weaned from governmental support. It enjoyed in its youth, from the '20's to the '60's, and still enjoys, the protection of high, at times prohibitive, import duties. In its manhood, within the last thirty or forty years, it has been encouraged and supported by a gigantic system of export bounties.

The discovery of sugar in the beet was made by a German apothecary, Margrave, in 1747. No attempt was made to apply this discovery practically until the close of the eighteenth century. The experiments then made by Achard in Silesia under government aid and encouragement, and by others in Austria and Russia under similar encouragements, served to call the attention of the world to the subject, but failed to produce immediately profitable results. It was the extraordinarily high price of sugar under the "Continental System," together with important direct aid from Napoleon and others, that first brought the industry into existence on a paying basis. Between 1808 and 1814 numerous factories were established in France, Germany, and Austria; and they turned out apparently not inconsiderable quantities of sugar. The factories of Germany and Austria disappeared with the artificial conditions which had called them into existence. In France a few managed to live on under the pro-

tection of a very high import duty, and in the hands of eminent chemists began to prosper again after a few years. The beet-sugar industry has had, therefore, in France a continuous existence from the time of Napoleon. The renewed prosperity of the industry dates from about the year 1820. The third decade of the century and the early years of the fourth saw the reintroduction of the industry into Germany, Austria, and Russia, and its introduction into Belgium.

The growth of the industry during the period 1825–1850 was in most cases a rapid one. Definite figures of the production before the subjection of the industry to taxation are, as a rule, not in existence. The taxation began in France in 1839; Germany, 1841; Belgium, 1843; Austria, 1848; Russia, 1849. The table below* affords an idea of the progress of the industry from 1853 until the present time, and of the comparative progress of beet and cane sugar. Of course these statistics cannot lay claim to great accuracy. In most of the cane-producing countries statistics are very inadequate. Moreover, in many European countries,—in Austria, Belgium, Russia, and Holland,

* SUGAR PRODUCTION FOR THE WORLD'S MARKETS.

(1,000 tons of 1,000 kilograms.)

YEAR.	Beet sugar.	Cane sugar.	Total.	Percentage of beet sugar.
1852-53	202	1,260	1,463	14.0
1859-60	451	1,540	1,792	25.7
1864-65	529	1,466	1,996	26.5
1869-70	846	1,740	2,586	32.7
1874-75	1,302	1,903	3,206	40.6
1879-80	1,539	1,988	3,528	43.6
1884-85	2,697	2,594	5,291	51.0
1889-90	3,523	2,507	6,000	58.2
1894-95	4,699	3,570	8,269	56.8
1895-96	4,281	2,945	7,226	59.2
1896-97	4,837	2,477	7,314	66.1
1897-98	4,755	2,864	7,619	62.3
1898-99	4,827	2,995	7,822	61.7
1899-1900	5,456	2,867	8,323	65.5
1900-1901	6,040	3,435	9,475	63.7

(From Conrad's *Handwörterbuch*, 2d edition, vol. vii. p. 1001.)

—not to mention more insignificant cases, accurate statistics for the whole or a part of the half-century are lacking, those given out being frequently only for the “amount taxed,” under systems of taxation which allowed considerable amounts of sugar to escape. It must also be borne in mind that these figures do not include either China or India; and the production and consumption of the latter country alone, according to conservative estimates, cannot be placed lower than 2,000,000 tons per year. In the world as a whole, therefore, cane sugar still holds the first place.

II. BEET AND CANE SUGAR AS COMPETITORS.

Before entering upon the examination of the legislation favoring the beet-sugar industry, it will be well to point out some of the salient characteristics of the cane and the beet respectively, to indicate the tendencies and attempt to estimate the importance of some of the peculiarities of the two plants, and of their conditions of growth and manufacture into sugar. Certain important facts stand out with especial prominence, and an understanding of their influence is essential to a proper appreciation of the legislative factors in the contest.

The success of the beet is obviously in large measure to be attributed to those general forces which have led to the concentration of the higher forms of civilization and of economic development in temperate rather than in tropical regions. If the conditions of soil and vegetation under the tropical sun were favorable to the cane-sugar producer by yielding him enormous crops with relatively slight expenditure of labor and exhaustion of the soil, the bracing climate of the temperate regions enables the beet producer to expend a much greater quantity of energy in the raising of his crops and the working up of his raw material into sugar. It is of great importance, also, that

in the tropics means of communication are very inferior, machinery is costly, fuel for the most part scarce, and the conditions of life in general such as to prevent, on the one hand, the creation of a high degree of intelligence on the part of workmen, and, on the other hand, to require important pecuniary inducements to bring about their importation from abroad. Political conditions generate insecurity of property and a consequent high rate of interest, lack of initiative in the adoption of improvements and general lethargy.

When we attempt to go beyond such a general statement as this, to compare in detail the productiveness of the two plants, the cost of their cultivation and working up into sugar, we enter a field in which it is extremely difficult to draw conclusions. It is impossible to compare satisfactorily in detail the cost of production of the two kinds of sugar. Such a comparison would rest necessarily on an exact measuring of the cost of labor in the two industries, which cannot for various reasons be successfully carried out. Statistics of wages in cane-sugar countries, even where they exist, are unreliable in the extreme. Moreover, statistics as to wages and salaries in the two competing fields are obviously of little value for the purposes in hand; for, in the case of agricultural labor generally, and more especially of labor under such widely differing conditions as are here considered, it is impossible to obtain a unit of measurement of even approximate definiteness. Such a comparison could lead to little more than a restatement, in another form, of the original problem.

There seems little doubt that the production of sugar from cane, for a given area cultivated, is greater on the average than from the beet. The extent of the advantage of the cane is not so great as might be supposed from some individual cases. The conditions of the planting and growing of the cane differ much more widely from

one country to another than do those of the beet. The latter has in all cases a period of from six to eight months of growth. The cane varies from nine or ten months in Louisiana to from twenty to thirty in Java. In the latter country, as in Eastern Asia generally, the cane is replanted after each harvest. In other places it is replanted only after three, four, or five harvests, the cane being allowed in the intervening seasons to grow up from the stubble. Stubble cane, however, yields continuously decreasing returns; and, for determining the actual yield of the cane, an average must be taken of the whole period of a planting. After taking these facts into consideration, Paasche * arrives at the following statement of the average yield of raw sugar (metric centners) per hectare cultivated:—

Germany, 34.6.	Hawaii, about 25 (planted).
France, 27.3.	Cuba, " 40-50 (harvested cane).
Russia, 17.1.	Martinique, about 30-32 " "
India, 22.6 (poor quality).	Guadeloupe, " 36 " "
Japan, about 10-20.	Demerara, " 32-38 (planted).
Java, about 75-80 (with nearly two years' growth,—per year, 40-50).	Louisiana, " 22-25 (harvested cane).
Philippines, about 20.	Egypt, 27-32.
New South Wales, about 25 (planted).	Reunion-Mauritius, 35 (planted).

It is safe to say also that the cane contains, on the average, somewhat more sugar per weight than does the beet, the relation being something like 16 or 17 per cent. for cane to 14 or 15 per cent. for beet.

Of considerably more significance is the fact that the nature of the non-saccharine substances with which the sugar is associated in the beets is such as, on the one hand, to present greater obstacles to the process of sugar manufacture, and, on the other, to render necessary a much more perfect freeing of the sugar from these substances, in order to make it suitable for consumption, than is the case with the cane. Beet juice, beet molasses, and raw

* *Zuckerindustrie und Zuckerhandel der Welt*, p. 344.

beet sugar are of an unpleasant odor and taste. The cane, on the other hand, was long cultivated in India for its juice alone before the process of crystallizing sugar was discovered. The molasses left after sugar extraction, in the case of the beet, is suitable only for producing raw alcohol, for fertilizing, or for feeding, after preparation, to cattle. In the case of the cane it is used in large quantities for the production of syrup and rum. Raw cane-sugar, as is well known, enters directly into consumption in large quantities in many parts of the world, especially in the tropics; and it is only since the cost of refining has been reduced to an insignificant figure, within the last decade or two, that raw cane sugar has definitely passed out of direct consumption in England and the United States.

Although the cane possesses advantages over the beet as a sugar producer, the beet has a decided advantage over the cane in the uses to which the chief by-product of the sugar factory, the pulp, can be put. It has already been seen that the beet was cultivated for cattle-feeding purposes before its use for sugar making began. When sugar began to be regularly extracted, the pulp was made to serve the same purpose which the entire beets had served before. In the early days of the beet-sugar making, when the processes of sugar extraction were very imperfect, the pulp retained a very high value for this purpose. It was found by experience to be subject to far less waste in the process of consumption by cattle than the original beets, and was consequently regarded as of nearly equal value with the latter. The sugar was looked upon as almost clear gain. The sugar factories were in those days very small, and were largely "agricultural industries," especially in Germany, Russia, and Austria, where large estates prevailed in the chief sugar districts. Individual *Gutsherrn* owned and ran their own factories, depending chiefly on their own fields for beets, and using

the pulp for fattening their own cattle, although they might also buy beets from and sell pulp to their lesser neighbors.

This cattle-feeding branch of the beet raising formed in the early years the chief strength of the beet-sugar industry. It is safe to say that, if the beet pulp could have been put to no better use than is the cane pulp,—that of fuel and fertilizing,—the beet-sugar industry would, up to within the last fifteen years, not have advanced beyond the experimental stage. With the extraordinary improvement in the art of sugar manufacture and in the sugar-yielding character of the beet, which has taken place within recent years, the importance of the cattle-feeding branch of the business has been very much lessened. In France, where, to be sure, the change has taken place later and more rapidly than in other countries, the average price of beets per metric ton was in 1881–82, 20.87 francs; that of pulp, 10.10 francs. In 1900–01, beets had risen to 29.71 francs, while pulp had fallen to 4.18 francs. During the same period the average percentage yield of sugar from beets increased from 5.84 to 11.93.

If the success of the sugar-beet industry was, in its early years, very largely dependent upon the use of the pulp for feeding, its progress and extension in recent years is largely to be attributed to the same force which has so greatly lessened the value of this by-product; namely, increase in the percentage of sugar secured from a given weight of beets. The improvement which has been made in this respect is certainly remarkable. Achard, who made the first practical application of Margrave's discovery, at the beginning of the nineteenth century, was proud of a yield of 3 or 4 per cent. A few years later, between 1809 and 1813, the sugar factories of Bohemia could boast of no greater yield than from 2 to 2½ per cent.* At the present time the average yield in Ger-

*J. V. Divis, *Beiträge zur Geschichte der Zuckerindustrie in Böhmen*, p. 5.

many, France, and Austria, runs from 10 to 13 or 14 per cent., and individual cases of 16 or even 18 per cent. are not uncommon. This increase has been the result of improvements in two directions,—(1) in the processes of manufacture, and (2) in the saccharine character of the beet.

The advance in manufacturing processes, by which a greater proportion of the sugar is extracted from the beet, or the same proportion at a smaller cost, has been brought about in the main by general mechanical improvements involving the saving of labor and of fuel, and by the reduction of waste through the increase of the scale of operations. One radical change in the nature of the sugar-extracting process, the introduction of *diffusion*, deserves particular mention. By the older processes the beets were first either ground or sliced; and the juice was then extracted by pressure, by centrifugal force, or was simply washed out. The process now generally in use, which was suggested by a Frenchman as early as 1821, and first put into successful operation in Austria in 1860, rests upon the principle of cellular diffusion. The sliced or ground beets are submerged in water of a given temperature (about 50° Centigrade), whereupon the sugar and a part of the non-saccharine substances pass through the cell walls, leaving in the pulp a part of the non-saccharine substances, which by the other processes are taken out, and must be removed later on from the juice. The astonishingly rapid progress in sugar yield in the early years of the application of this process, and the difficulties which the governments of several countries, especially Austria and Russia, experienced in their efforts to adapt the legislation to the changes, will presently be seen. The rapidity with which the process was substituted for the older ones in the several countries serves as a good indication of the comparative progressiveness of their sugar manufacturers.

In recent years, under pressure of competition from beet sugar, especial efforts have been made to improve the methods of cane-sugar manufacture. This has been done very largely by the adaptation to cane-sugar manufacture of methods first introduced into beet-sugar making. Efforts in this direction have been attended with numerous difficulties. (1) Improvements have involved usually an increased use of fuel for furnishing steam power and for heating water for diffusors. Fuel, however, is in most tropical countries scarce and costly. Moreover, the pulp of the diffusion process is left in a wet condition, and must be especially dried before being fit for use as fuel, for which it is generally used.* (2) Improvements depend very largely on increased size of factories. Means of communication are usually inferior and difficult of maintenance in the tropics, so that it is difficult for the large factories to secure a sufficient supply of cane. Some of the smaller islands of the West Indies, which a half-century or so ago were the seats of a very prosperous sugar industry with numerous factories, cannot now produce cane enough to supply a good-sized modern factory. (3) The improvement in processes calls for constantly improving intelligence on the part of the workmen and managers, and this is difficult to find among the natives and costly to import.

Scarcely less important than the improvement in the beet manufacture has been the advance of the agricultural side of the industry. The selection and growing of beet-seeds has become one of the highest branches of modern agriculture. Efforts have of course been directed to improving the size as well as the quality of the beet. The nature of the legislation in several countries has, however, given a special impetus to the latter tendency. While

*The moist condition of the pulp exercised a considerable influence in retarding the adoption of diffusion in beet-sugar manufacture, especially in France and Belgium, where the peasants at first objected to the use of this moist pulp for feeding purposes.

this has in some cases led to a sacrifice of the size of the beet to its quality, and therefore to a development not wholly desirable, the general tendency to an increase in the saccharine quality of the beet cannot but be regarded as an advance. It has especially in its favor the fact that it tends to reduce the exhaustion of the soil from beet culture. Sugar being a carbohydrate, the elements which go to form it are drawn almost entirely from the atmosphere; and the beet consequently draws less of the strength from the soil as its proportion of sugar increases.

It is no doubt owing in large part to the general backward condition of the topics that no great corresponding improvement in the character of the sugar cane has been made. It seems probable, however, that the characteristics of the cane itself are responsible for a part of this backwardness. The cane is planted, not from seeds, as is the beet, but from slips or tops. Numerous experiments in the selection of tops for planting have, according to the British government analyst, Mr. J. B. Harrison, led to no result. Only within the last dozen years or so has it been rediscovered that the cane can produce fertile seeds, and serious attempts made to improve it by the selection of seeds for planting.* It is as yet too early to judge whether these experiments may in time lead to development of the sugar cane similar to that which has taken place in the case of the beet. Mr. Harrison is

*"The Results of Recent Scientific Researches into the Agricultural Improvement of the Sugar Cane," in *Sugar Cane*, September, 1897. On the subject of this discovery, Mr. Harrison says: "Until within the last ten years the idea that the sugar cane could produce fertile seeds was by the great majority of planters and botanists regarded as absolutely without proof, and attempts to raise canes from seeds were regarded to be as futile as I hold attempts to obtain graft hybrids are. How this scientific and popular error arose it is difficult to tell. Some years ago, with the assistance of Mr. Carruthers, the keeper of botany at the British Museum, I searched through a lot of old botanical works; and we could find no trace of this belief until about 1750, when Hughes wrote his *Natural History of Barbados*. Nay, more, we found descriptions of the seed of the sugar cane so complete and accurate that Carruthers considered they must take precedence of all recent work."

hopeful, and thinks that "the facts that in this colony [British Guiana], in Java, and in Queensland canes have been raised from seed having considerably higher sugar contents than the staple varieties show are most encouraging, and should lead to increased activity in pursuing this line of research." To an outsider the results do not seem very encouraging. In Barbados, where this line of research originated, no favorable results have been attained. Increase in size, moreover, where secured, has been at the expense of quality, and improved quality at the expense of size. "We have raised," he says, "several varieties yielding individual canes of great size, far in excess of that of any known kind ; but, unfortunately, these have all been of low saccharine strength. We have not succeeded in obtaining as yet large-sized canes of exceptionally high saccharine strength, but hope to do so in the future."*

Mention must also be made, in speaking of the competitive disadvantages of the sugar cane, of the effect of the abolition of slavery. The question is too wide in its bearings to be discussed here at length. However salutary, both morally and economically, abolition may prove in the end to be, its immediate effect has certainly been in some places little less than disastrous to the sugar industry ; and it has been immediately beneficial to it almost nowhere. The fiscal systems of the cane-producing countries have also been, in the main, the opposite of encouraging. In a few cases, notably the French colonies, Louisiana, and Hawaii, protection has been given to the industry. The French colonies even enjoy the benefit of the export bounties now granted by the home government in case the

*From a careful article on "West Indian Sugar-cane Experiments," in the *London Times* of January 11, 1902, it appears that these attempts to improve the character of the cane continue to be "promising" without having as yet yielded definitely ascertained success. Moreover, experiments carried out with a view to discovering the best existing breed of cane for cultivation gave widely divergent results for 1900 and 1901. The differences are ascribed to the weather.

sugar goes to France. In other cases, however, it has been export duties rather than bounties which the industry has had to face. On the whole, the influence of governmental interference with the industry has, at least until very recent years, been rather disadvantageous than the contrary.

III. LEGISLATIVE FORCES IN EUROPE.

The sugar legislation of Europe, it needs scarcely be said, has not been determined solely by the interests of the beet-sugar industry. On the contrary, it has been the resultant of a complex of forces whose relative importance has varied considerably from one time to another and in different countries, but whose general tendencies have remained comparatively constant. The most important of the forces which will have to be considered are the following: (*a*) the consumers of sugar, their attitude towards the legislation, and the attitude of the government and of the various industrial interests towards them; (*b*) the refiners and the legislation affecting them; (*c*) the raw sugar producers and their interests as affected by the form of the domestic sugar taxation, and by the bounties, direct and indirect, on export; (*d*) the fiscal interests of the government.*

* Other interests which might be included are those of the colonies and those of the merchant marine. The latter were much in evidence during the infancy of the beet-sugar industry. The cane sugar of the West and East Indies furnished return cargo to vessels carrying out European products, and the encouragement of the beet-sugar industry was vigorously combated on that account. The colonial interests have been of influence among beet-sugar producing countries, chiefly in France. The French colonies have been afforded protection for many years, and they share at present to a large extent in the favors granted to the domestic beet-sugar industry. After the emancipation of the slaves, between 1851 and 1870, there was even a differential (at first ten per cent. and then gradually reduced) in favor of colonial sugar. Other countries, such as Holland and Spain, have been rather exploiters than protectors of their sugar colonies. England comes in a different category. She has no beet-sugar industry, and her colonial interests will consequently be best discussed in connection with the movement for the repeal of the bounties.

A. The Consumers.

The sugar legislation of Continental Europe differs from that of America and the British empire in that it has been very little influenced, comparatively speaking, by the interests of the consumers. England abolished her sugar duty as early as 1874, almost solely out of deference to the interests of the consumers, and has only been induced to resort again to the tax by the revenue necessities of the war. In the United States, also, a strong feeling exists in favor of free sugar; and the temporary removal of the tax by the McKinley act would doubtless have become permanent but for the greater insistency of various producing interests, coupled with the fiscal difficulties of the bounty on production which that act introduced. On the continent of Europe such a feeling is scarcely to be noticed: This is to be explained by the widely different position which sugar occupies in general consumption. The annual average per capita consumption of sugar in Russia is only about 14 pounds; in Austria-Hungary, 17 or 18; in Belgium, 23; in Holland, 32; in Germany, 34; in France, 37. In the United States, on the other hand, it rises to 69 pounds, and in England to more than 80. These figures no doubt exaggerate the differences between England and the Continent. Much of the sugar which figures in the statistics of consumption in England is used for the manufacture of jams and preserved fruits, which are only in part for domestic consumption. Indeed, some of the bounty-fed sugar from the Continent finds its way back to the country of its origin, and is consumed in this disguised form. After all allowance has been made for this factor, however, it remains true that the consumption of sugar on the Continent is far less than in English-speaking countries.

The sugar tax is objected to in America and England on the ground that it weighs most heavily on the poorest

classes. On the Continent this seems hardly to be the case, certainly not to anything like the same extent as in the United States. The point is one difficult of precise determination, and cannot here be entered into at length. Some idea of the position of sugar in the consumption of the people of Germany may be gained from the investigation into the expenditure of a number of German households by Neuman,* which resulted, so far as sugar consumption was concerned, as follows:—

INCOME (marks).	Sugar consumption (pounds).	Costing (marks)	Involving tax of about (marks)	Relation of tax paid to income (percentage).
Over 10,000	286	145	25.7	0.11
4,000-10,000	153	72	13.7	0.22
2,000-4,000	85	46	7.7	0.27
1,200-2,000	38	17	3.4	0.24
800-1,200	32	14	2.9	0.29
Under 800	9	3.5	0.9	0.17

The pronounced falling off in the consumption of the lowest class is significant. This class nearly corresponds to that which by the Prussian law of 1891 is exempt from income tax payments (900 marks).

The foregoing serves in large part to explain why such attempts as have been made on the continent of Europe, with or without success, to reduce the sugar tax with a view to increased consumption, have aimed not in the main at an increase of consumption for its own sake,—to sweeten the lives of the poorer classes and gladden the hearts of the children,—but rather to increase the demand for the products of a domestic industry whose maintenance was thought for one reason or another to be of great importance, and whose foreign market was recognized to be precarious. Such attempts have emanated

* *Gemeindesteuerreform in Deutschland*, quoted by W. Katzenstein, *Die deutsche Zuckerindustrie und Zuckerbesteuerung*, p. 201. In the case of salt, according to the same investigation, the tax made only 0.02 per cent. of the income in the first class and 0.56 per cent. in the lowest class.

not from the spokesmen of the consumers, but from the producing interests. In recent years a considerable agitation in this direction has arisen. Reduction of taxation is, in fact, only one of several measures now being urged for the purpose of increasing sugar consumption. General newspapers and periodicals, as well as the chief organs of the sugar interests, contain much discussion of the value of sugar as nourishment for man and beast. A favorite scheme is that of introducing sugar into the rations of the soldiers, or, where this has already been done, of increasing the allowance. In this instance, it is urged, the government is able to help the sugar producers directly to a better home market. The soldiers will also, it is thought, take the taste for sugar, acquired in the service, back to their homes, when their terms are over, and spread it among their neighbors and friends. This movement has become much more marked since the action taken by the International Sugar Conference in March, 1902. Confronted by the probability, in case the convention is ratified, of a much less profitable foreign market than heretofore, the cry for increased home consumption has become louder than ever.*

B. The Refiners.

The refining industry began and flourished long before the beet was made use of for sugar production. Among industrial forces influencing the sugar legislation, therefore, the interests of the refiners were earliest in the field; and they have continued to exercise at least an indirect influence on the legislation affecting the raw sugar pro-

* Dr. Brukner concludes his able article on "Zuckerausfuhrprämien und Brüssler Vertrag," in Conrad's *Jahrbücher für Nationalökonomie und Statistik*, April, 1902, as follows: "Die Ausfuhrstaaten wird es aber nur dann vor einer Katastrophe bewahren und vor allmählichem stetigen Rückschritt ihres Rübenbaues und ihrer Landeskultur, wenn gleichzeitig die Thore des inneren Konsums soweit als möglich geöffnet werden, wenn die Verbrauchsabgabe weit unter ihr jetziges Mass in allen beteiligten Staaten herabgesetzt wird."

duction. They have, moreover, been almost constantly mixed up and more or less confused with the latter in economic and popular writing on the subject.

Almost every country which has had a refining industry has afforded it constant protection. A solitary exception is the case of England between the giving up of the sugar tax in 1874 and its reimposition in 1901. The protection has been afforded, in those countries which import raw sugar, by what is known in this country as the "differential"; that is, an import duty on refined sugar higher in proportion to value than that on raw sugar. The export of refined sugar has also at one time or another been favored by indirect or direct bounties in all countries having a refining industry of relative importance. This includes France, Germany, Austria, Holland, Belgium, England, and the United States. The history of the refined sugar bounties, indeed, reaches back as far as the middle of the seventeenth century, when a bounty was decreed in France. Until recent years the bounties on refined sugar were of much greater importance and attracted more attention than those on raw sugar exports. It was on account of the refined sugar bounties that the first International Sugar Conference, that of 1863, was called. On the expiration of the ten years' convention entered into at the conference of the next year, 1864, these bounties became the subject of several other conferences. It is only at the last three conferences, the London conference of 1888 and the Brussels conferences of 1898 and 1902, that the bounties on raw sugar have assumed the leading rôle on the programme. At these latter conferences alone have Germany and Austria, as well as France, England, Belgium, and Holland, been represented. The refined sugar bounties have been in the main indirect, and have arisen in the same way that the indirect raw sugar bounties arose; that is, by the payment of a drawback on exportation more than equivalent to the duty paid. Originating usu-

ally in a purely accidental manner from the difficulty of determining the saccharine quality of raw sugar with accuracy, they have afterwards been maintained for the encouragement of industry and through the influence of vested interests.

The refined sugar bounties have certainly had no small economic influence. They have contributed to the changes which have taken place in the geographical distribution of the refining industry, to the maintenance and growth of the industry in France, to its rise in recent years in Austria and Germany, to its stationary or declining condition in England and Belgium, and to that peculiar development by which Holland, once the centre of the sugar trade and sugar-refining industry of the world, and still a large possessor of sugar colonies, has become a refiner of Belgian, German, and domestic beet sugar, while the cane sugar of her colonies has practically ceased to be imported, but finds a market in England, America, and Australia.

Owing to the universal desire on the part of governments to pay all sugar bounties out of sugar revenue only, the bounties on raw and refined sugar are always indirectly related and in some measure dependent on one another — any increase of the one diminishing by so much the capacity of the government to pay the other. Where the government, for the protection of its fiscal interests, has resorted to the expedient of fixing a maximum total bounty, as in Austria since 1888, or a minimum net revenue, as in Belgium, the relation between the two classes of bounties becomes very close. Legislation giving rise to bounties on the export of refined sugar has, moreover, at times exercised an artificial influence on the processes of raw sugar manufacture. This was especially true of the legislation while the so-called “Dutch Standard of Color” was used for the classification of sugars. Towards the middle of the nineteenth century the old classification

into simply raw and refined sugar began to appear inadequate for the purposes of customs revenue administration. The method in use by merchants for the sale of colonial sugar in Holland was therefore adopted in most countries for taxing purposes. This method adopts color as the standard of purity of sugar, and takes a series of twenty types, running from number one, which is nearly black, to number twenty, which is pure white sugar. On the adoption of this system, efforts soon began to be made on the part of sugar makers to evade the tax by giving a dark color to comparatively rich sugar. Numerous means of artificial coloring were tried, with varying success. Before long it was discovered that by the application of extra heat in boiling down the syrup, so as to burn a small part of the sugar, a very dark sugar of high saccharine quality and value could be obtained. Such sugars could be imported at a low rate of duty, and, on being refined and exported, received a drawback higher than the duty paid. Thus arose most of the refined sugar bounties between 1840 and 1880, and the sugar legislation of this period is largely taken up with efforts to obviate this difficulty. This episode affected at first, for the most part, cane-sugar manufacture only. Domestic beet-sugar taxes were assessed on different principles. When beet sugar began to be exported, however, it came under the same provisions which applied to cane sugar on importation into another country. By 1880 the polariscope had been so generally adopted in Europe, either as the sole or as an auxiliary, method of ascertaining the quality of sugar, that since that date the legislation giving rise to the refined sugar bounties has had little or no direct influence on the processes of beet-sugar manufacture, although the Dutch standard difficulty continued to trouble the treasury department of the United States for several years.*

* See David A. Wells, "How Congress and the Public deal with a Great Revenue and Industrial Problem," *Princeton Review* of November 1, 1880.

C. The Raw Sugar Producers.

Coming now to the legislation directly affecting the production of raw beet sugar, the earliest encouragements took the form of prizes, gifts, and exemptions from taxation. These forms of aid are nearly confined to the infancy of the industry in each country. In the more important European countries they scarcely appear since the revival of the industry after the fall of Napoleon. In those countries, in and outside of Europe, where the sugar industry, or attempts to develop one, is of more recent date, they still play an important rôle. A more recent form of encouragement, closely allied to these, is the granting of especially favorable rates on the government railways, which have been granted, not only to the raw materials and the finished product of the sugar industry, but also to the agricultural laborers who migrate temporarily into the sugar-beet-growing regions. The most important of such movements of laborers is the annual migration from north-eastern Prussia and Silesia into the richest of the sugar-producing regions of Germany, the Province of Saxony, and known as the *Sachsengängerei*. Similar in nature to the favorable railway rates is the partial exemption from taxation granted to certain factories on account of unfavorable situation as related to the refining and exporting centres. This is the *taxe de distance* of the complicated French sugar legislation. It is obviously in the main of only local importance. Here should also, perhaps, be mentioned the shipping subsidies of various states, which tend, in some degree, to the reduction of the transport cost of sugar and other commodities.

From the first the beet-sugar industry has enjoyed the protection of import duties. This continued even after the introduction of the domestic taxes, the latter being in all cases originally very much lower in rate than the

import duties. The progress of the industry, and the consequent falling off of the revenues from import duties, led to successive elevations of the rate of the domestic tax; but a complete equalization of the two taxes occurred in no case before the industry had become able to supply practically the whole of the domestic consumption. The protection has indeed been maintained after that date, except in Holland. In an industry less subject to artificial conditions this continued maintenance of the protective import duties would usually be regarded as a mere form, having—aside from the case of monopoly of the domestic market—only local or temporary importance. In the case of the sugar industry, however, the existence of export bounties has preserved the importance of protective duties, even to the present time. Were it not for the higher tax on foreign sugar, German producers, aided by the bounty, might find it very profitable to send their sugar to France, while the French were at the same time sending theirs to Germany. Indeed, were the bounties high enough, nothing would prevent the producers of two countries from profitably swapping products entirely.

The import duties have acquired greatly increased importance during the last few years in consequence of the formation of monopolistic organizations in several countries for the control of the domestic market. The first of these organizations was the so-called “*Normirofka*” entered into by a majority of the Russian factories in 1887. The members of the organization pledged themselves to put on the Russian market only a certain part of their total product, the remainder to be exported or stored for future use. The quota for domestic sale, or “*Norm*,” of each factory, was determined by taking the average production of the last five years and subtracting one-tenth. The immediate result of the formation of this combination was a rise of the price of sugar within the country from 2.90 to 4.0 rubles per pood, bringing a con-

siderable increase in the profits of the sugar producers. The export of sugar, on the other hand, was carried on at a loss, which increased as the prices in the world's markets continued to fall. This agreement continued in fairly successful operation for nearly eight years. In 1895 it was brought to a close, largely by the refusal of several newly erected factories to enter it. The government then came to the rescue, and undertook a strict control of the sale of sugar, following the general plan of the "Normirofka." That control has been continued, and forms the basis of the Russian export bounty. During the past few years similar monopolistic organizations have been formed in Austria and Germany. Under their influence the domestic prices have experienced a considerable rise, and the profits, at least of the refiners, been very much increased.

It is obvious that the operation of such artificial enhancing of the domestic prices by monopolistic organizations, or by government control, is closely similar to that of a bounty on export. In both cases the exporter is enabled to sell at lower prices in the foreign market. In the one case the bounty passes through the hands of the government, being collected in the form of taxes and paid to the exporter. In the other case it is secured directly by those who control the domestic and export markets, the government lending its aid to the process by the establishment of protective import duties. The importance of these sugar "cartels" as affecting the international sugar trade was fully recognized at the recent sugar conference, and led to the insertion in the convention of the clause requiring the reduction of import duties to six francs.

Of far greater importance than the influence of protective import duties has been that exercised by the forms of taxation to which the domestic sugar has been subjected. The systems of legislation which have grown

up about the sugar industry in the several countries of Europe are as various and in most cases as complicated as could well be imagined. They follow, however, two general lines, although with considerable intermixture. There is first the system which goes directly at the finished product, subjecting the whole process of manufacture to minute supervision in order to prevent any sugar from escaping the tax. This is known in Germany as the *Fabrikatsteuer*, in France as the *régime de l'exercice*. The other system is that by which the tax is levied, not upon the finished product, but upon some form of the raw material of which it is produced or in accordance with some external indication of the amount of sugar produced by a given factory. There are three main forms: (1) The tax on the beets by weight as they come to the factory. This form of tax was in use in Germany until 1892. (2) A modification of this tax used in Austria until 1888 and in Russia until 1881 is the "lump sum," or *Pauschalirungssystem*. In this case the weighing of the beets is dispensed with; and an estimate of the amount of beets used is made, based upon the capacity of the machinery in use in each factory. (3) Another indirect method of taxation is that by which the beet juice is taken as the basis. This system has been applied chiefly in Belgium and Holland.

The direct method of taxation, or tax on the finished product with supervision of the manufacture, is theoretically the most just to all producing interests, and the most advantageous to the treasury. It aims to tax each pound of sugar of a given quality at the same rate, wherever or however produced. It confers no favor on one producer at the expense of another, and the government is sure of its revenue. Its chief faults are: (1) It is costly, requiring the maintenance of an army of supervising officers. (2) The government provisions for supervision usually present obstacles, often

of a serious character, to the adoption of changes in the methods of manufacture, and hence to improvement. The indirect methods of taxation, on the other hand, while each has its peculiar characteristics, are all directly opposed in general tendency to the direct method. They tend to favor the more efficient producer at the expense of the less efficient. They give a handicap in the race of competition, not in favor of the slowest, but of the fastest. If one manufacturer can extract more sugar than another from a given amount of beets or of beet juice, or can manipulate his machinery more rapidly, he not only gains the greater amount of sugar thus produced, but he is practically exempt from taxation on that amount. Accordingly, while these forms of taxation were originally contrived chiefly, if not wholly, in order to save expense in tax collection, they have in many cases been retained, in spite of serious fiscal difficulties, for the sake of the encouragement to improvement which they afford.

The nature of this encouragement, it is important to note, is different from that of protective duties. By protective duties an industry is shielded from foreign competition. It is given an opportunity, which it may or may not accept, to advance to a position which will enable it to compete with foreigners on equal terms. But there can hardly be said to be any special *stimulus* to such improvement. If there is an opportunity for improvement, there is also one for slovenliness and retrogression. Indeed, it has been frequently charged that protective duties have served to keep alive old processes and keep running old machinery which have been discarded elsewhere. Now the indirect forms of taxation of the beet-sugar industry afford a direct stimulus to improvement. They give in themselves no protection against foreign producers, although, since with the progress of improvement they tend to become ever lighter, they will serve in the progress of time to accentuate any

protection which may be afforded by a difference between customs and excise duties. This, however, is of very slight importance. Primarily, the stimulus is to improvement in the industry itself. The beet grower is given an artificial inducement to produce as rich beets as possible. The manufacturer is induced to extract the last particle of sugar from his beets, or juice.

The operation of this stimulus is not the same in the case of all the taxes, nor is it solely a stimulus to improvement. The "lump-sum" tax encourages the adoption of any process of manufacture which serves to evade a part of the tax, whether this process constitutes really an improvement or not. The beet-juice tax affords a stimulus only to the extraction of as much sugar as possible from a given amount of juice, the extraction of the most possible juice from the beets and the production of rich beets being little or not at all encouraged.* All of these tax systems, moreover, induce the manufacturer to carry on his processes of sugar extraction beyond the point which would be, under normal conditions, profitable. This is especially disadvantageous on account of the uses to which the by-products are put, the pulp being weakened for cattle feeding without a corresponding gain, aside from the avoidance of taxes.

On the agricultural side the stimulus afforded by the beet tax in particular is scarcely that which would be desired. The inducement is not to the production of the most possible sugar, or even the greatest amount economically desirable, from a given area cultivated, but to the production of as much sugar as possible from a given weight of beets. The richness of the beets may be brought about simply at the expense of their size,—a result which

* Strictly speaking, there seems to be an encouragement of an indirect kind to the production of rich beets by the juice tax, since the juice of such beets yields most sugar. On the other hand, the extraction of the last drop of juice from the beet is rather discouraged because of the poorer quality of the last juice extracted.

is seen to a very marked degree in France since her adoption, in 1884, of a tax system practically identical in effects on the industry with the beet tax. A discrimination, which can hardly be regarded as advantageous, is brought about between different agricultural districts. Some soils and climates are naturally suited to the production of large beets of relatively low saccharine quality. Such soils are placed at an artificial disadvantage as compared with those which are suited to the production of small rich beets.

The influence of these forms of taxation upon the development of the industry has been most remarkable since the growth of the industry beyond the needs for domestic consumption. As soon as sugar began to be exported, demands were made for the repayment of the excise duties, in order that the exporter should not be at a disadvantage in his competition with foreigners. Such a drawback was, in most cases, readily granted. But it will at once be seen that, in order to pay back the duty, the yield in sugar of a given amount of beets or of juice, or the capacity of the machinery, must be determined. The government is obliged, if it does not wish to supervise strictly the whole process of manufacture, to fix upon an estimate of the yield of beets in sugar. A variety of forces contribute to the fixing of this "legal yield" below the actual. In the first place, the manufacturers themselves are alone likely to be thoroughly conversant with the processes of manufacture. Their knowledge must be largely relied upon, and their influence will tend to secure the placing of the yield as low as possible. As there is always considerable difference, moreover, in the efficiency of different factories, some of them will have a greater actual yield than others. The question at once arises, Which yield shall be taken as the legal one, the highest, the lowest, or the average? The government is evidently between the horns of a dilemma. If the lowest is taken,

most producers receive a bounty. If any above the lowest is taken, some producers are virtually subjected to an export tax. Where the question is one between an export bounty and an export duty, there has usually been little hesitancy in choosing the former.

But, even if the strength of fiscal motives is great enough to withstand these forces and secure the placing of the legal yield so high at any time as to preclude the payment of a bounty, the government has had another and yet stronger force to contend with, that of improvement in the processes of manufacture and in the methods of beet culture. If the government would prevent the appearance of a bounty, it must be continually on the alert, watching every new invention, and ready to change at any time the legal yield to meet new conditions of production. This the government can scarcely be expected to do, at least with promptness; and where, as is sometimes the case, the fixing of the legal yield and of the drawback is not left to administrative action, it has usually required a severe fiscal crisis or a strong agitation to bring the cumbrous machinery of legislation to bear upon the difficulty. The growth of the export bounty system is thus seen to be almost inevitable, if the industry shows itself capable of a more rapid growth than that of the domestic consumption. No other course than that maintained by the government of Sweden, steady refusal to pay drawbacks at all, would seem adequate to prevent the appearance of a bounty.

D. The Fiscal Interests of the Government.

The tendencies of the fiscal interests of the government are comparatively simple. However much they may have been, at one time or another, sacrificed to other interests, they have uniformly sought the attainment of a large and constant or increasing revenue. It was the

interests of the treasury which led to the first imposition of import duties, then to that of the domestic tax; and those interests have formed the chief influence tending to check the growth of the bounties. The fixing of minima for the sugar revenues or of maxima for the bounties, which several governments have resorted to for the protection of the fiscal interests, has had considerable effect on the sugar industry by causing the bounty to fluctuate from year to year, according as the export was large or small relatively to the internal consumption.

It would be impossible within the limits of the present article to discuss the actual operation of these several forms of taxation in all of the sugar-producing countries of Europe. As an illustration of their tendencies, and, especially, of the fiscal difficulties to be contended with, a brief sketch of the sugar tax and bounty in one country may be given. Austria-Hungary will serve our purpose best on account of the variety of tax measures and of expedients resorted to for the protection of the revenues. The taxation of the domestic product began in 1849 with a direct sugar tax. This was replaced in the next year by the beet tax, which, in turn, was modified in 1856 by the optional and in 1865 by the required determination of the amount of beets subject to taxation according to the capacity of the machinery for sugar extraction. This method, the *Pauschalirungssteuer*, was maintained, with numerous changes from time to time in the details of its administration, until the adoption of the tax on the finished product in 1888.

At the time of the adoption of the "estimated capacity" method, the Austrian sugar was just beginning to seek a foreign market. The sugar manufacturers were stimulated in their endeavors to evade the tax, which had been possible under the previous system also, by the prospect of an export bounty. Circumstances were much in their favor. The new process of sugar extraction by diffusion

had just been brought to successful experimental operation. As yet, however, in 1865-66, not one of the 140 factories in operation made use of this process. Ten years later there were 176 working with diffusion, and only 56 with presses. Even before this change of system in 1865 the beet tax had undoubtedly afforded very considerable advantages to the more efficient sugar producers, and thereby a stimulus to improvement in processes of manufacture and in the quality of beets. With the advent of the new system, however, the energies of the manufacturers were in large part turned in another direction; namely, to the evasion of the tax by the use of new processes not contemplated in the official estimates.

We have no means of knowing accurately how much the estimates of the government fell short of the actual yield of sugar. Until the adoption of the more accurate method of taxation in 1888, the Austrian government made a record only of the sugar taxed, and not, as was done in Germany, of the total produced. There is accordingly no way of knowing, except by rough estimates, the total production and consumption of sugar before that date. The growth of the payments for drawback from some 70,000 florins in 1863-64 to over 9.4 millions florins in 1875-76, in which year the drawback more than swallowed up the whole sugar revenue, affords a good indication of the extent of the underestimation. The only change in the direction of a check to this growth of the bounty was a slight reduction of drawback in 1868. In 1875, however, the government became thoroughly aroused; and the estimate for factories with diffusion was raised in rapid succession, from 180 to 222 in 1875, then to 370 in 1876, to 1,100 in 1878, and to 1,800 in 1879. The sugar makers were able, however, by substituting small for large diffusors, and by greatly increased rapidity of operation, to keep ahead even of these extraordinary changes. In some factories the actual capacity in

1879-80 was as high as 5,300, or about three times as great as the official estimate.* The drawback still continued to swallow up the whole or the greater part of the revenue.

In 1880-81 the government gave up the attempt to estimate the capacity of diffusors per day, and substituted an estimate according to the number of fillings with beets. But the manufacturers were not to be so easily thwarted. The energy which had formerly gone to increasing the rapidity of the diffusors by reducing their size now turned to the work of changing their form so as to increase their actual as opposed to their apparent and estimated capacity.† By a law of June 18, 1880, for each hectolitre of capacity in the diffusors, a weight of beets ranging from 40 to 87.5 was estimated, according to the size and nature of the machinery. In the next year this estimate was fixed at from 46 to 100 kilograms. According to private estimates the real capacity for the minimum was 50 or 55 in place of 40 in 1880-81 and 60 instead of 46 in 1881-82.‡ In 1882 a new invention brought a further saving of about 20 per cent. This was followed by an addition of only 9 per cent. to the official estimate for the factories using the invention.§ By a decree issued in 1885 a further general rise to from 50 to 109 took place.|| The relation of the drawback affords sufficient indication that the producers were able to keep ahead of this change also. In addition to these measures for reducing the bounty, there was a reduction of the drawback in 1881 and an increase in the tax on the beets in 1880.

In the mean time the government had found more efficient means of protecting its fiscal interests. This was by the requirement of a minimum net yearly revenue from

* Julius Wolff, *Die Zuckersteuer, ihre Stellung im Steuersystem, ihre Erhebungsformen und finanziellen Ergebnisse*, Tübingen, 1882, p. 57.

† Wolff, *op. cit.*, p. 93.

‡ *Bulletin de Statistique*, vol. xxii. p. 542.

§ Wolff, *op. cit.*, p. 96.

|| *Finanzarchiv*, 1886, p. 41.

sugar. Should the payments for drawback bring the revenue below this sum, the difference was to be made up by repayments from the factories in proportion to their (taxed) product. The minimum was fixed at 6 millions of florins for 1878-79, and 6.5 for 1879-80. It was then increased for the next year to 10 millions, and was to increase by 0.4 yearly until it reached 12.8 millions in 1887-88, when a new revision of the legislation was to be undertaken. This programme was, with slight modifications, carried out. The controlling factor in the determination of the drawbacks and bounty was not the original amount of the drawback, but the amount of these repayments. They were unnecessary in two years only. In other years they formed very considerable proportions of the net revenue; and in one year, in consequence of the original drawback having exceeded the gross revenue, the repayments were larger than the net revenue.

With the adoption of the tax on the finished product in 1888, this system of repayments continued to be the controlling factor in the situation, although it underwent a change of form. The new tax system dispensed with the drawback, as only sugar consumed within the country was subject to the tax. The indirect bounty, therefore, disappeared. The industry was here, as in Germany, however, granted a direct bounty. This varied from 1.5 florins to 2.3 florins according to the quality of the sugar. But the maximum of payments for the bounty was fixed at 5 millions, and very considerable repayments have been yearly necessary to bring them down to this amount. In 1896 Austria-Hungary joined in the general movement for an increase of bounties which Germany in that year started. The increase was made, not by changing the original rate of the bounties, which alone would have had for effect only to increase the amounts of the repayments, but by raising the maximum from 5 to 9 million florins. We have, therefore, the curious spectacle of the govern-

ment for more than twenty years annually paying out enormous sums for drawbacks and bounties, and then proceeding to re-collect from the sugar producers large proportions of these sums. The system had the obvious advantage down to 1888 of making the amount of net revenue which the government could count upon definitely known beforehand. It might be more, but it could not be less than the required minimum. The drawback bounty, on the other hand, varied from season to season according to the proportion of the domestic consumption to the export. An increase in the proportion of export would lower the rate of the drawback bounty, and *vice versa*. There was, consequently, an inducement to increase the domestic consumption, in order to increase the profitableness of the export. The limitation of revenue was, moreover, so arranged, whether intentionally or not, as to afford the largest rate of bounty when the industry most needed it. Bad harvests or other unfavorable conditions would reduce the amount of product. If this reduction were general, the result of similar conditions in other countries, there would be at least partial compensation to the producers in the resulting rise of price. But, if Austria alone were affected, then the rise of prices could scarcely be so great. In that case, however, there would be less reduction of the domestic consumption, the proportion of export to consumption would decline, bringing, as already seen, an increase in the rate of the drawback bounty.

The new system, in operation since 1888, lacks several of these advantages. There is a maximum limit to the payments for bounty, but no direct minimum limit to the revenues. So long as the maximum provision comes into operation, which has regularly been the case, the rate of the bounty varies from season to season. It varies, however, inversely to the amount of the exports, having no relation to the amount of the domestic consumption.

Both the old and the new systems have the disadvantage of leaving the rate of the bounty or drawback for the year uncertain until the end of the year. It is a constant subject for speculation, how much the original rate of the bounty may have to be reduced on account of excess payments. Such uncertainty, undoubtedly, serves to divert considerable portions of the bounty from the producers into the hands of speculators.

The sugar legislation has followed somewhat similar courses in all of the important producing countries of Europe except France. In Germany there was a beet tax and an indirect export bounty down to 1888. Then for a brief transition period there was a double system, a beet tax, much reduced in rate, added to a consumption tax (*Verbrauchsabgabe*) on the sugar itself, so far as consumed within the country. In 1892 the beet tax was entirely given up, and consequently the drawback and the indirect bounty disappeared. A direct bounty was introduced; but provision was made for its gradual reduction and final disappearance, and it was hoped that other countries would follow the example thus set of bounty reduction. The hope was not fulfilled, and a new crisis in the sugar industry led to an increase of the bounties in 1897. At the same time the German government endeavored to prevent an inordinate growth of the payments for bounty by limiting the total sugar production and the product of each factory. Any excess of the quota thus fixed for a factory must pay an additional tax equal to the export bounty (2.50 marks per 100 kilograms). New factories pay this tax on the whole of their product the first year, on one-half the second year, and do not receive a quota free from extra taxation until the third year. These provisions, although discouraging the establishment of new factories, tend rather to expansion on the part of those already established. Each factory tries to keep up its production at the highest point possible,

sometimes with a view rather to the quota for later years than on account of the present profitableness of the industry. For a factory to shut down for a year or to run short time during a dull season would obviously spoil its chances for the future. This attempt of Germany to limit the extension of the sugar industry is another form of remedy for the same fiscal difficulties which gave occasion to the establishment of a minimum revenue, and later of a maximum bounty, in Austria, and to the introduction of similar features into the legislation of Belgium, Holland, and France. Were the bounty repealed, there can be little doubt that the attempt to control the growth of the industry would be abandoned.

The method of control adopted by Germany seems essentially an imitation of that employed by Russia since the failure, already recounted, of the "Normirofka" in 1895. Russia had originally made use of a "lump-sum" tax similar to that of Austria, but in 1881 changed to the tax on the finished product. The change involved the disappearance of the indirect export bounties, which had grown to considerable proportions during the late '70's. The great increase of the world's sugar product during the next few years brought on a crisis in the Russian sugar industry. The government, accordingly, in 1885 introduced temporary direct export bounties. These bounties were not very satisfactory to the sugar interests, largely because of the requirement that they be paid back—except in the case of exports to Asia—to the treasury within four years, through the medium of additional taxes. They were therefore discontinued after 1886, except the non-reimbursable part, which continued until 1891. Since the latter date, Russia has not formally paid any bounties, although the manner in which she has controlled the production and sale of sugar within the country has been such as to afford advantages equivalent to a bounty on export.

Belgium has had from the outset a juice tax, which, from the beginning of net sugar exports, about 1860, has afforded an export bounty through the medium of the drawback. In order to prevent the inordinate growth of this bounty, the "legal yield" of sugar has been raised, by several stages, from 1,200 grams in 1843 to 1,900 in 1897. More important, however, has been the requirement of a minimum sugar revenue,—a feature which was introduced as early as 1849, and has continued to be of controlling importance in the determination of the bounty. In Holland a juice tax was also in use until 1897, when a consumption tax on sugar was introduced. In place of the indirect bounty afforded by the juice tax, a direct bounty has been granted. This bounty is granted as a fixed sum to be distributed annually among the producers and refiners in proportion to their production. The maximum was fixed at 3 millions florins for 1897-98 (of which 500,000 goes to the refiners and the remainder to the producers of raw sugar). The total is to be decreased gradually until it reaches 1,950,000 florins for 1905-06, at which point it is to remain.

In France the history of the legislation has been very different from that of the other countries. Down to 1884 the tax system, although nominally according to the juice extracted, was in reality one of comparatively strict supervision. It did not afford an export bounty on raw sugar, and the bounty which was long maintained on refined sugar appears to have been of no practical importance to the raw sugar producers. The result of this lack of legislative encouragement was seen in the comparative growth of the industry in France, Austria, and Germany after the export of sugar began. A net export of sugar from France began as early as 1869-70. The exports increased slowly until 1874, then decreased, until in 1880 there was an excess of imports over exports. During the same period the industries of Germany and Austria were in-

creasing with great rapidity. The French began to be seriously alarmed at this condition of affairs, and an agitation sprang up for governmental assistance to the industry. In response to this demand a reduction of the rate of taxation was carried out in 1881 in the hope of relieving the industry by increasing the demand for domestic consumption. The expected increase in consumption promptly took place, but was, unfortunately, largely covered by an increase of imports instead of an increase of the domestic product. Then in 1884 came a fundamental change of system. Supervision of the processes of production is retained, and careful account is taken of the percentage of sugar extracted from each ton of beets. The tax is imposed only on the sugar corresponding to a certain percentage (originally 6 per cent.). The excess of this percentage, if such excess is actually secured, is free from taxation. This system is essentially that of the beet tax formerly employed by Germany. It is extremely popular in France, and has been retained in principle, although undergoing numerous modifications of detail since its first introduction. It has undoubtedly brought about a remarkable transformation of the sugar industry of the country. Better methods of beet raising and of manufacture have been introduced, and the actual percentage of sugar secured on the average has been doubled. The transformation has not, however, been wholly desirable, the increase in sugar yield having been brought about, in part, at the expense of the yield of beets per hectare, which has declined; and also, in part, at the expense of the pulp, whose richness and consequent value for feeding purposes has been greatly lowered. A considerable indirect export bounty is afforded by this system. In 1897, however, as an answer to the revival of bounties by Germany, France introduced in addition a direct bounty. To cover the latter, an extra tax was imposed; and it was provided that, if the payments therefor

should exceed the proceeds of the extra tax, the excess should be recovered by reduction of the bounty for the succeeding year,—a provision which it has been necessary to apply every year.

IV. BOUNTY ABOLITION.—ENGLAND'S ATTITUDE.

However glad the governments of Europe would be to abolish the bounties, there seems little prospect of their being able to do so by independent action. Mutual international jealousies and the insistence of the producing interests form obstacles apparently too great to be overcome. The only serious attempt in that direction was that made by Germany in 1891, which was a signal failure. The producing countries seem powerless to get rid of the incubus without external aid, and especially that of the chief European consumer of sugar, England. The London International Conference of 1888 led to no results, because England failed to ratify the convention. The Brussels Conference of 1898 adjourned without even formulating a convention, because England was not ready to take aggressive action. That the Brussels Conference of 1902 was brought to a successful conclusion was chiefly owing to the fact that England assumed a firm attitude. Whether the bounty-paying countries will ever be driven to abolish the system, it rests with England to decide.

The economic interests of Great Britain in regard to the sugar bounties may be briefly stated. Opposed to the system are the interests of the British refiners and of the British sugar-producing colonies. The former desire the repeal of the bounties on refined sugar, the latter of the bounties on raw sugar. In favor of the bounties of both kinds, or at least opposed to any definite action on the part of England against them, are the British jam and confectionery producers and the general consuming public. Of these interests, those of the refiners, although

formerly very important, have now assumed a subordinate position, owing to the decline of the refining industry of the country. In the years immediately after the repeal of the English sugar duties, in 1874, it was a question of preserving an important British manufacturing industry from destruction. At present the destruction has to a large extent already taken place, and the introduction of protective duties would doubtless tend to the creation of a new refining industry. But little aid would thereby be given to those who have lost on account of the bounties in the past. Much more important, at present, are the interests of the jam and confectionery trades, to whom cheap sugar is a great advantage.

The interests of the consumers have heretofore prevailed. The repeal of the sugar duties twenty-eight years ago was carried out in their interests, and only the financial pressure of the war has sufficed to cause their revival. The chief representative before the public of the consumers is the Cobden Club. It has steadily opposed any action by England tending to force the abolition of the bounties. Recently it has been appealed to by the leading French opponent of the bounty system, M. Yves Guyot, and asked to come out in opposition to the bounties. The whole system, he urges, is opposed to free trade, and ought, therefore, to be opposed by the followers of the great free trader, Cobden.* The reply of the club is that Cobden favored freedom of trade because it was advantageous, and not merely on theoretical grounds. The bounties are from a cosmopolitan point of view a curse, and ought to be abolished. The club would welcome their abolition by the efforts of the countries which pay them and suffer from them. "The Cobden Club, following the example of the illustrious man whose name it bears, has always held that free trade is to be secured by persuasion and argument, and not by retalia-

* See letters in the *Times*, January 27, February 13, and March 1, 1902.

tion or coercion." The remedy of countervailing duties would be worse than the disease, even if England were suffering from the disease, which she is not, but rather England's neighbors. There is "no reason why England should go out of her way to refuse a boon which the folly of Continental countries confers upon her."

Up to the present the views of the Cobden Club have on the whole prevailed. England has sent delegates to the conferences, she has at times talked of attacking the system of bounties; but she has as yet refrained from actually imposing countervailing duties to be paid by the British consumer. Public sentiment in England has, however, for a number of years past been moving away from the old ideals of free trade and colonial independence. The competition of Continental powers in the colonial field during the past eighteen or twenty years has done much to lead British sentiment to the acceptance of the ideals so ably set forth by Seeley in *The Expansion of England*. The comparison of colonies to fruit, which falls from the tree as soon as it becomes ripe, no longer holds sway. Its place has been taken by the idea of a British Imperial Zollverein, as a step towards closer political union between the mother country and her colonies.

As regards the sugar industry, the first definite action of government in the direction indicated was the imposition of countervailing duties on bounty-fed sugars imported into India. This action of the legislative council of British India was taken at the instance of the home government,* and apparently with a special view to the interests of the British colony of Mauritius. The refusal of the House of Commons, after a spirited debate, on June 15, 1899, by a vote of 293 to 152,—a majority, according to the *Times*, larger than the government could

*See the extracts from the correspondence on the subject, published by the *Economist*, May, 1899.

then command on a strict party vote,—to urge the disallowance of the Indian council's action is of considerable significance. There is, to be sure, a wide difference between the introduction of countervailing duties in India and the passing of similar legislation in England, although done by the same government and for the same object. One reason, no doubt, for the forcing of this legislation on India was to learn the attitude of English public sentiment on the question, and perhaps prepare the way for the adoption of similar measures in England. The war has brought a feeling of greater solidarity on the part of the colonies and the mother country, so that the passage in the near future of countervailing duties by Parliament, either in pursuance of the decision of the recent sugar conference or independently thereof, would be much less surprising than formerly. The new sugar duty, moreover, although passed for revenue purposes, renders the problem of protecting the West Indian planters an easier one. A simple remission of the duty on sugar from the English colonies would serve the same purpose as a countervailing duty on European sugar, and in all probability would be much easier to pass.

The attitude of England towards the sugar question must be looked at from the political as well as from the economic point of view. In the growing disposition to do something for the protection of the sugar colonies, one can see much more of the movement for imperial federation than of any change of opinion on purely economic questions. The sugar bounties appear to offer a good opportunity to England of showing what it would be possible for her to do for her colonies, were the mooted Zollverein an accomplished fact. English statesmen, who are supporting the movement for countervailing duties, keep but half an eye on the sugar colonies. They, no doubt, welcome the opportunity of relieving the economic distress of the latter. But they undoubtedly have chiefly in

mind the effect which may be produced, by the passing of such legislation by Parliament, on the public sentiment of Canada, South Africa, and Australia. On the occasion of the reintroduction of the sugar duty in England, two years ago, it was remarked that now a part of the bounties would go into the British treasury, and thus the Continental powers would help to support the war in South Africa. If the movement for countervailing duties prevails in England, British imperialism will have conferred a great boon upon the bounty-paying countries by supplying an efficient instrument for ridding them of an extremely troublesome problem.

CHARLES S. GRIFFIN.

TOKYO IMPERIAL UNIVERSITY.